

## **Scope of work for drilling and installing well clusters in the Miocene aquifers in Dorchester, Caroline, and Talbot Counties, Maryland**

The Maryland Geological Survey (part of the Resource Assessment Service at DNR) will be conducting a groundwater resource study on the Eastern shore in 2010. We will be drilling and installing a nest of 3 observation wells at 4 sites in Dorchester, Caroline, and Talbot Counties. An initial probe hole may be drilled by the USGS at each site for geologic control and will ultimately be filled in. We are now in the process of locating the well sites and after reviewing DNR owned land, we have identified two tracts of Chesapeake Forest Land in Dorchester County as possible drill sites. Only one site would be utilized for the project. The specific areas of interest are already cleared areas near the entrance gates to the Warner Complex (D24) and the Lecompte Complex (D21) (please see attached maps and aerial photos for detailed locations).

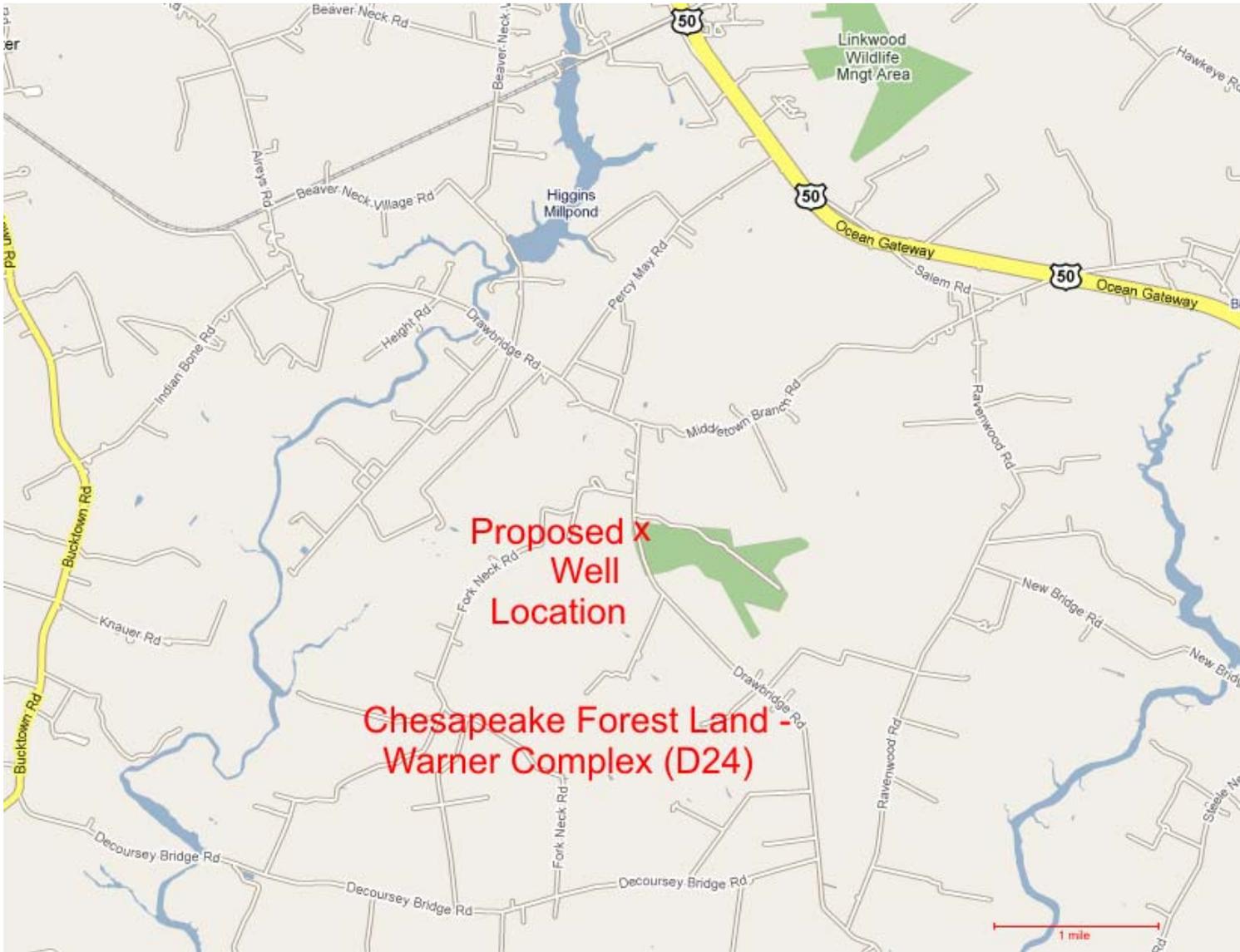
In general, the area required for drilling equipment would be about 1000 sq. ft. and the time required for drilling and testing of the wells would be 2 to 4 weeks at each site. The finished product would be three 6" dia. observation wells, spaced ~15' apart, and extending 3 ft. above ground. The wells will either be equipped with recorder platforms (a 3 ft. square metal box) or a locking cap (please see the attached photos of typical observation wells). Ideally, we would need access to the wells for long term water-level monitoring.

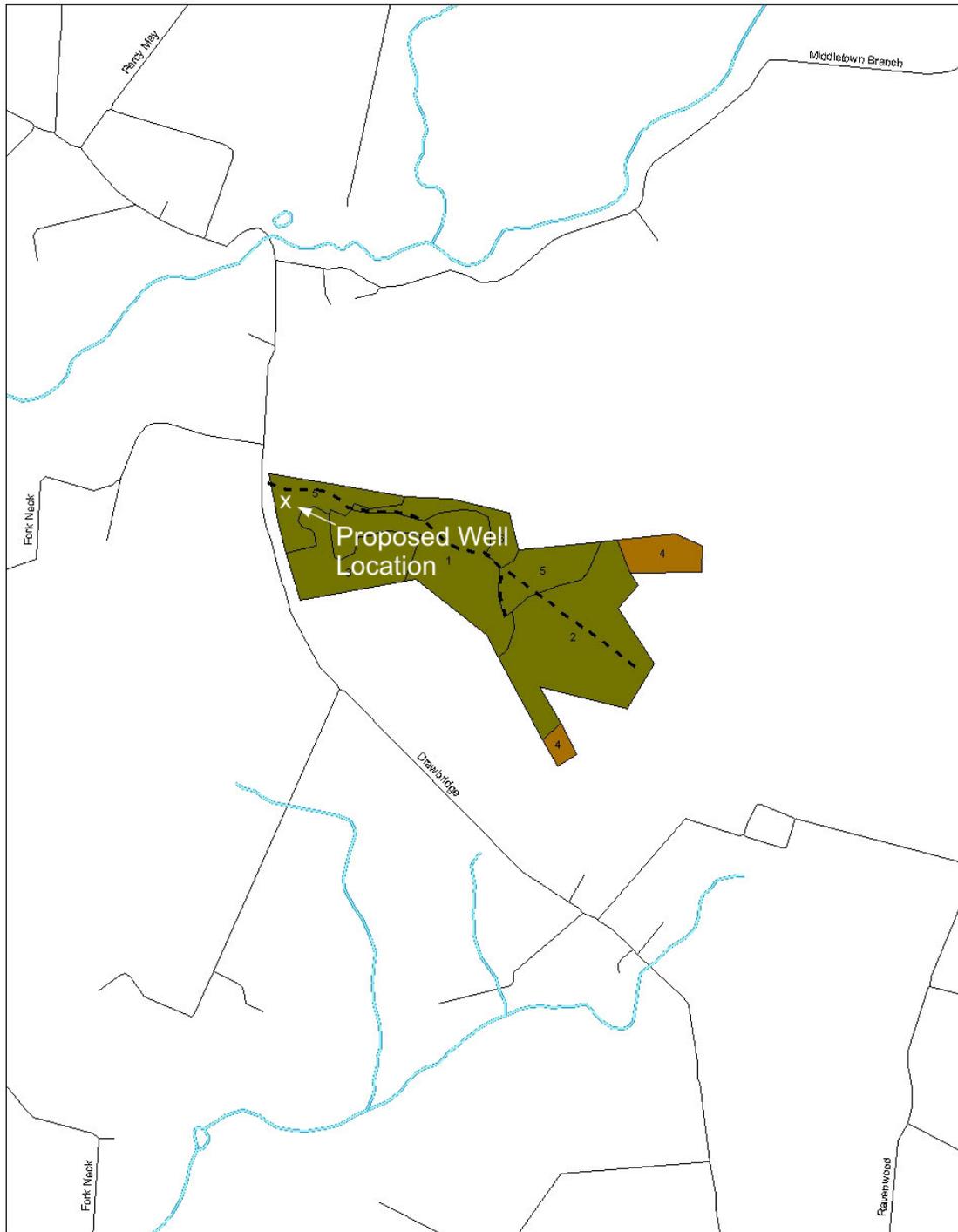
### **Objectives and Methodology of the Project**

The Miocene aquifer system is used extensively for water supply in Dorchester, Caroline, and Talbot Counties, Maryland, and parts of western Delaware. This aquifer system includes (from deep to shallow) the Cheswold, Federalsburg, and Frederica aquifers. These aquifers were described in a report by the USGS (Cushing, Kantrowitz, and Taylor, 1973), but their hydrogeologic characteristics were not thoroughly documented, and no subsequent study has been conducted to assess the hydrogeology of these aquifers. It is uncertain whether these units act as independent aquifers or a single hydraulic unit, or how they correlate with similar aquifer units in Delaware. These considerations are important in determining whether MDE ground-water appropriations should be issued for three individual aquifers or for a single composite aquifer. Few observation wells are screened in these units, which are needed to monitor water-level trends and estimate available drawdown. A number test-well clusters are needed assess the hydraulic characteristics of this aquifer system, and determine the connectivity of the individual units.

At four sites, clusters of three test wells are to be installed, one each in the Cheswold, Federalsburg, and Frederica aquifers. An initial probe hole may be drilled by the USGS, to be filled in following the project. The first test well borehole will be drilled through the Cheswold aquifer, into the underlying confining unit (from 350 to 500 feet deep). Cuttings samples will be collected at 10 or 20-foot intervals, and geophysical logs will be obtained on the open borehole. The lower section of the borehole will be plugged, and a test well installed with a screen in the Cheswold aquifer. The second borehole will be drilled into the Federalsburg aquifer, and a test well installed. The final borehole will be drilled into the Frederica aquifer, and a test well installed to complete the test-well cluster. About five down-hole cores will be obtained from aquifer and confining unit material for hydraulic and biostratigraphic analysis during drilling of the boreholes. A 24-hour aquifer drawdown (pumping) test will be performed on each test well, followed by a 24-hour recovery test; water levels will be measured in all three wells during each test. Water samples will be collected near the end of the drawdown tests, and analyzed for major ions and other chemical constituents. All test wells will be equipped with automatic water-level recorders to monitor water-level trends for one year, after which water levels will be measured by hand on a monthly or yearly basis.

**Cushing, E.M., Kantrowitz, I.H., and Taylor, K.R., 1973, Water resources of the Delmarva Peninsula: U.S. Geological Survey Professional Paper 822, 58 p.**





- 1. 42.3 L P PF 1986 3 2002(T1) GENERAL
- 2. 48.7 L P PF 1991 2 GENERAL
- 3. 26.1 L P PF 1971 3 2002(T2) GENERAL
- 4. 13.7 MH N PF 1936 3 GENERAL
- 5. 32.7 L P PF 1977 2 2002(T2) GENERAL
- 6. 11.4 L P PF 1982 2 2002(T1) GENERAL

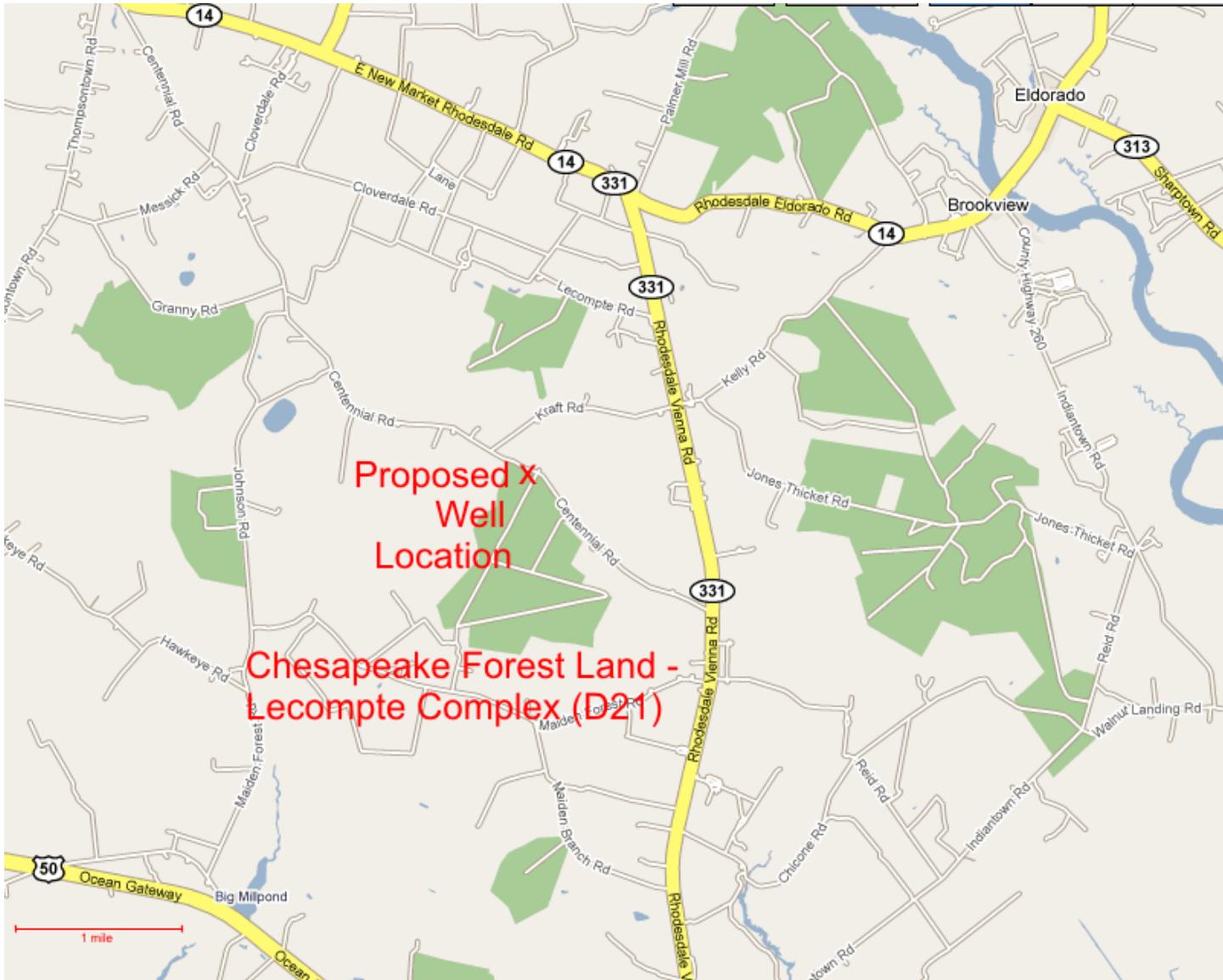
**D24**  
 Wamer Complex  
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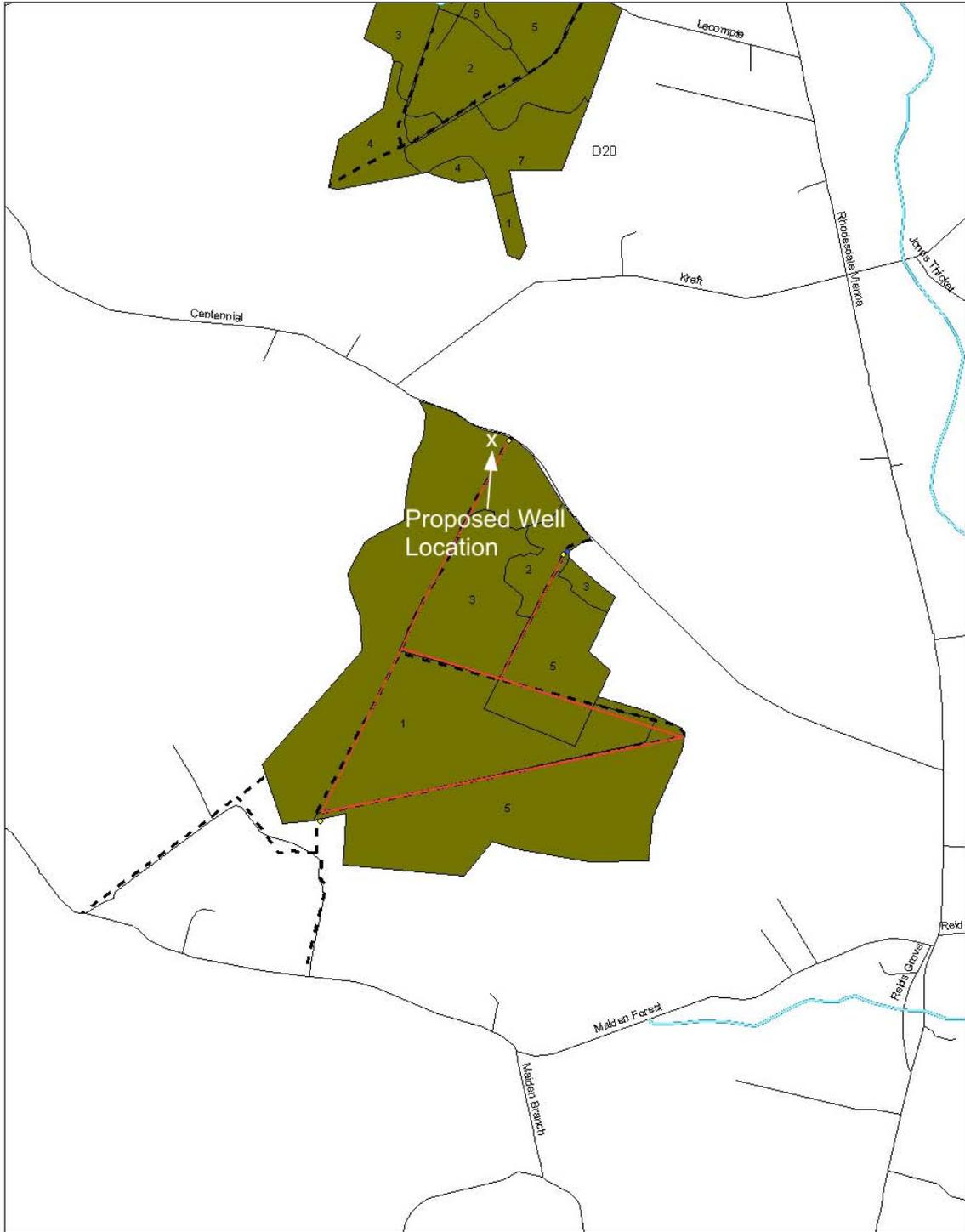


1"=1320'

Pg 29







- |            |                      |     |
|------------|----------------------|-----|
| 1. 216.4 L | P PF 1988 3          | ESA |
| 2. 16.0 L  | P PF 1982 3          | ESA |
| 3. 56.7 L  | N PF 1988 3 1995(T0) | ESA |
| 4. 47.7 L  | P PF 1989 3          | ESA |
| 5. 115.6 L | N PF 1988 3          | ESA |

Lecompte Complex  
**Public Hunting Area**  
 Boundary Lines painted 2005

**D21**



1"=1320'



